Conscious Sedation or General Anesthesia for TAVR: When Should We Consider General Anesthesia?

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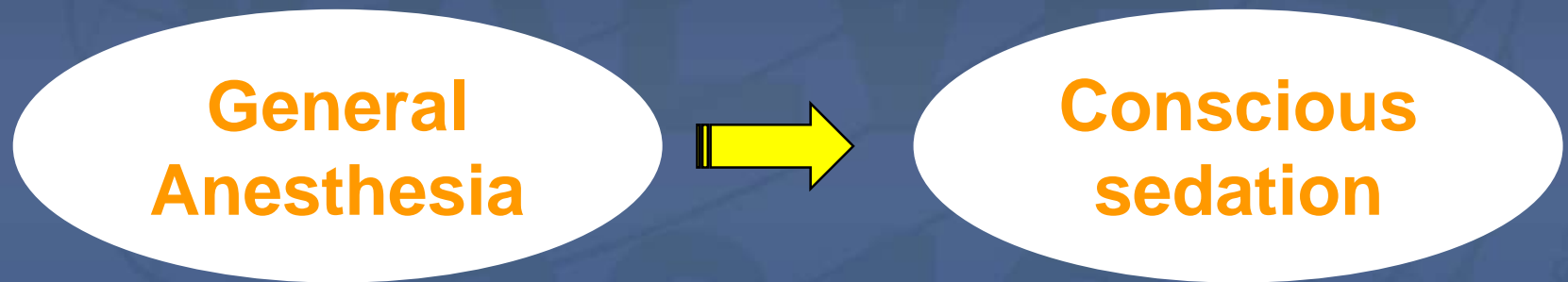**Department of anesthesiology and pain medicine, Ulsan College of Medicine , Asan Medical Center**

Current trend of TAVR

Wide &

Minimal

TAVR minimalist

- The primary advantage of TAVR has always been its less invasive nature as compared with surgical aortic valve replacement

General Anesthesia → **Conscious sedation**

In our center

- **The first case**
  - 2010.3 83/F
  - GA with full cardiac monitoring
    (including A-line, SG-catheterization)

- **In these days**
  - Most cases are performed under conscious sedation
    (only A-line)
  - Dexmedetomidine + Remifentanil continuous infusion

Anesthesiologists prefer general anesthesia

- More familiar than conscious sedation

- Easy to control ventilation

- More invasive monitoring/information

- If complications, lines/monitoring to treat already in place

Why conscious sedation?

- Avoid the hemodynamic instability associated with intubation/extubation
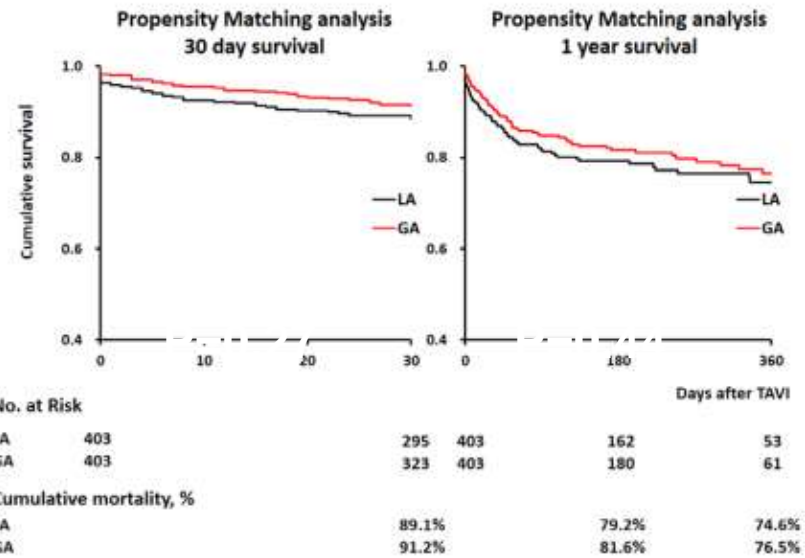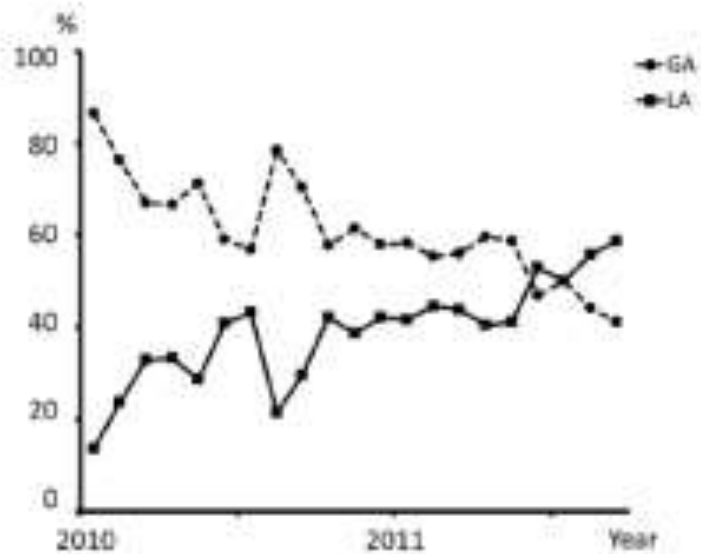
- Continuous neurologic monitoring

- Rapid recovery

Improve Patients Safety

General anesthesia vs. Conscious sedation

Structural Heart Disease

Clinical Outcomes and Safety of Transfemoral Aortic Valve Implantation Under General Versus Local Anesthesia
Subanalysis of the French Aortic National CoreValve and Edwards 2 Registry

Atsushi Oguri, MD; Masanori Yamamoto, MD; Gauthier Mouillet, MD; Martine Gilard, MD; Marc Laskar, MD; Helene Eltchaninoff, MD; Jean Fajadet, MD; Bernard Iung, MD; Patrick Donzeau-Gouge, MD; Pascal Leprince, MD; Alain Leguerrier, MD; Alain Prat, MD; Michel Lievre, PhD; Karine Chevreul, MD; Jean-Luc Dubois-Rande, MD; Romain Chopard, MD; Eric Van Belle, MD; Toshiaki Otsuka, MD; Emmanuel Teiger, MD; on behalf of FRANCE 2 Registry Investigators

Circ Cardiovasc Interv. 2014;7:602-610.)

General anesthesia vs. Conscious sedation

A

*p<0.001

■ General Anesthesia
▪ Conscious Sedation

Apr 2014 -Jun 2014 (N=702)   July 2014 -Sep 2014 (N=2195)   Oct 2014-Dec 2014 (N=2386)   Jan 2015-March 2015 (N=2681)   April 2015-June 2015 (N=3033)

TVTR Procedure Start Date
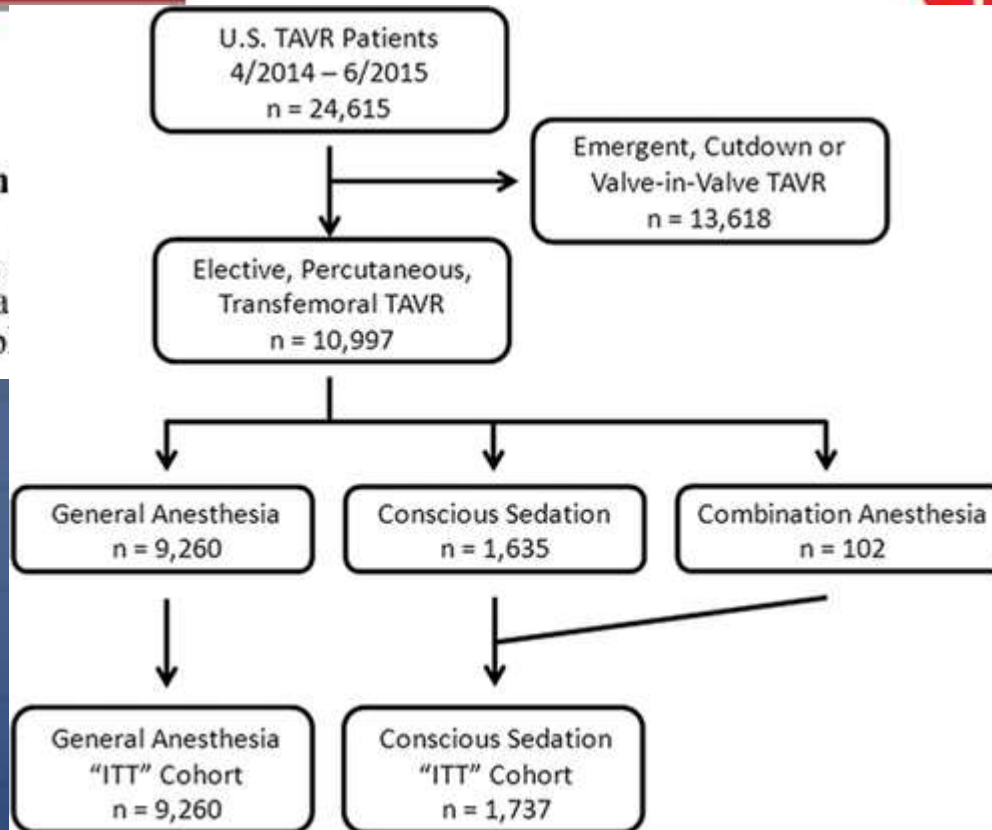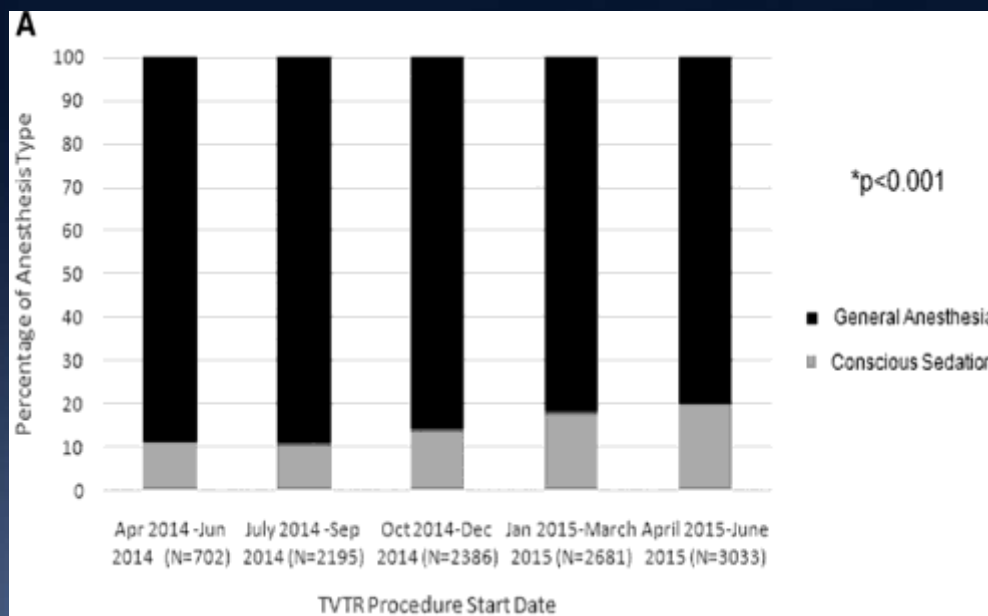
Table 2. Post TAVR Outcomes in Patients Separated by Anesthetic Type.

Outcome	Unadjusted General Anesthesia	Unadjusted Conscious Sedation	P Value	Odds Ratio*	95% CI	Adjusted General Anesthesia	Adjusted Conscious Sedation	P Value	Odds Ratio*	95% CI
In Hospital Outcomes										
Mortality (%)	2.5%	1.6%	0.03	0.65	(0.44, 0.96)	2.4%	1.5%	0.01	0.63	(0.54, 0.75)
Mortality/Stroke (%)	4.2%	3.1%	0.03	0.72	(0.54, 0.96)	4.1%	3.1%	<0.001	0.75	(0.66, 0.85)
Procedural Success (%)	98.5%	98.2%	0.31	0.82	(0.56, 1.21)	98.6%	97.9%	<0.001	0.72	(0.57, 0.90)
Intraprocedural Inotrope Use (%)	43.9%	36.8%	<0.0001	0.74	(0.67, 0.83)	43.7%	29.3%	<0.001	0.55	(0.52, 0.58)
Procedural Duration (hours)	2.1 ± 3.4	1.9 ± 2.9	0.0003	0.95	(0.92, 0.99)	1.7 ± 1.6	1.9 ± 1.5	0.14	0.98	(0.95, 1.01)
Hospital Length of Stay (days)	6.7 ± 9.6	6.0 ± 10.7	<0.0001	0.99	(0.98, 1.0)	6.5 ± 5.5	6.0 ± 7.1	<0.001	0.79	(0.78, 0.80)
Discharge Home (%)	74.8%	80.7%	<0.001	1.41	(1.24, 1.61)	74.4%	77.1%	<0.001	1.51	(1.40, 1.64)
30-day Outcomes										
Mortality (%)	4.1%	2.9%	0.03	0.70	(0.50, 0.97)	4.0%	2.3%	<0.001	0.64	(0.55, 0.73)
Mortality/Stroke (%)	6.4%	4.8%	0.02	0.74	(0.57, 0.95)	6.4%	4.8%	<0.001	0.78	(0.69, 0.87)

Adjustments were made by inverse probability weighting. *Odds ratios report general anesthesia as the reference cohort for binary endpoints which were modeled using logistic regression. Relative risks were calculated for procedural duration and hospital length of stay using the Poisson model with robust variance

In our center

Procedural Outcomes in AMC

	Overall (N = 285)	GA (n = 183)	CS (n = 102)	P value
Procedural success	277 (97.2%)	176 (96.2%)	101 (99.0%)	0.17
Conversion to surgery	5 (1.8%)	5 (2.7%)	0 (0%)	0.09
Coronary obstruction	1 (0.4%)	1 (0.5%)	0 (0%)	0.46
Permanent pacemaker	30 (10.6%)	19 (10.4%)	11 (11.1%)	0.85
Paravalvular leakage > moderate	37 (13.0%)	30 (16.4%)	7 (6.9%)	0.02
Major vascular complication	16 (5.6%)	15 (8.2%)	1 (1.0%)	0.02
Length of hospital stay (days)	8.7 ± 8.9	10.4 ± 9.4	5.7 ± 5.3	< 0.01

30 days outcomes in AMC

	Overall (N = 285)	GA (n = 183)	CS (n = 102)	P value
Death, all	9 (3.2%)	8 (4.4%)	1 (1.0%)	0.12
Cardiac death	6 (2.1%)	6 (3.3%)	0 (0%)	**0.07**
Non-cardiac death	3 (1.1%)	2 (1.1%)	1 (1.0%)	0.93
Stroke, all	12 (4.2%)	11 (6.0%)	1 (1.0%)	**0.04**
Disabling stroke	5 (1.8%)	4 (2.2%)	1 (1.0%)	0.46
Death or disabling stroke	14 (4.9%)	12 (6.6%)	2 (2.0%)	0.09
Bleeding	112 (39.3%)	80 (43.7%)	32 (31.4%)	**0.04**

When Should We Consider General Anesthesia?

- The TAVR-specific indications for general anesthesia have not been studied.

- Generally, considerable factors are……

Anesthetic consideration: GA vs. CS

- **Patients factor**
  - Positioning
  - Cardiopulmonary comorbidities
  - Airway problems
  - Cooperablilty

- **Procedural factor**
  - Surgical approach
  - Mechanical support
  - Movement/Breath holding
  - Experience of heart team
  - Using TEE

In our center

- Need for a surgical approach

- Intubated state

- Severe cognitive impairment

- Severe pulmonary decompensation

- Heart team wants general anesthesia

General conversion cases in AMC

- Four cases were converted to GA
    - Procedure – related (3 case)
        - LV rupture
        - Femoral artery rupture (2 cases)

    - Patient - related (1 case)
        - Heart failure d/t acute aortic regurgitation(1 case)

- Decompensated heart failure

Summary

- Minimalist TAVR strategy has been more adopting, and performing a TAVR under conscious sedation is at least as safe as GA

- The TAVR-specific indications for general anesthesia have not been studied.

- In our experience, conscious sedation in patients with severe cognitive impairment or pulmonary decompensation and decompensated heart failure requires careful attention.